

IN THE CLAIMS:

Amendments to the Claims

Please amend claims 1, 4, 6, 8, 10, 12, 15, 17, 20 and 22 as shown below.

Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A processing method for semiconductor devices in a semiconductor fabrication line, comprising the steps of:

processing a substrate in a first processing apparatus;

transferring the substrate processed in the first processing apparatus to a detecting apparatus without removal of the substrate from the semiconductor fabrication line while continuing fabrication of the semiconductor devices;

detecting foreign particle defects on the substrate transferred to the detecting apparatus utilizing a foreign particle detector having a pitch variable spatial filter to cut a light reflected from a pattern formed on the substrate, wherein a light cutting portion of the pitch variable spatial filter is pitch variable according to the pattern;

sending a detected signal from the detecting apparatus to a foreign particle detecting processing apparatus which is separate from the detecting apparatus;

processing the detected signal sent from the detecting apparatus by the foreign particle detecting processing apparatus;

determining a foreign particle generation condition of the processing apparatus based on information processed by the foreign particle detecting processing apparatus;

transferring the substrate detecting in the detecting apparatus to a second processing apparatus in the semiconductor fabrication line; and

processing the substrate in the second processing apparatus, wherein an amount of the foreign particle defects detected in the detecting step is stored in a memory.

2. (original) A processing method according to claim 1, wherein in the detecting step, detection is performed in a predetermined area of the substrate.

3. (original) A processing method according to claim 1, wherein in the detecting step, detection is completed within a processing time in the processing step.

4. (previously presented) A processing method for semiconductor devices in a semiconductor fabrication line, comprising:

processing a substrate in a first processing apparatus;

transferring the substrate processed in the first processing apparatus to a detecting apparatus without removal of the substrate from the semiconductor fabrication line while continuing fabrication of the semiconductor devices;

detecting foreign particle defects on the substrate transferred to the detecting apparatus within a processing time in the step of processing utilizing a foreign particle detector having a pitch variable spatial filter to cut a light reflected from a pattern formed on the substrate, wherein a light cutting portion of the pitch variable spatial filter is pitch variable according to the pattern;

sending a detected signal from the detecting apparatus to a foreign particle detecting processing apparatus which is separate from the detecting apparatus;

processing the detected signal sent from the detecting apparatus by the foreign particle detecting processing apparatus;

storing a data of foreign particle defects detected at the detecting step, and processed at the processing of the detected signal step in a memory; and

controlling an operation of the semiconductor fabrication line in accordance with the data of foreign particle defects detected.

5. (original) A processing method according to claim 4, wherein in the detecting step, detection is performed in a predetermined area of the substrate.

6. (currently amended) A processing method for semiconductor devices in a semiconductor fabrication line, comprising:

processing a substrate in a first processing apparatus which is a component of the semiconductor fabrication line;

detecting foreign particle defects on the substrate processed in the first processing apparatus utilizing a plurality of illumination optical units and a plurality of detection optical units without removal of the substrate from the semiconductor fabrication line while continuing fabrication of the semiconductor devices while utilizing a foreign particle detector having a pitch variable spatial filter to cut a light reflected from a pattern formed on the substrate, wherein a light cutting portion of the pitch variable spatial filter is pitch variable according to the pattern;

sending a detected signal from the detecting apparatus to a foreign particle detecting processing apparatus which is separate from the detecting apparatus;

processing the detected signal sent from the detecting apparatus by the foreign particle detecting processing apparatus;

counting an amount of foreign particle defects detected at the detecting step and processed at the processing of the detected signal step; and

controlling an operation of the semiconductor fabrication line in accordance with the data of foreign particle defects detected.

7. (original) A processing method according to claim 6, wherein data of the amount of foreign particle defects of the substrate counted in the counting step is stored in a memory.

8. (currently amended) A processing method for semiconductor devices in a semiconductor fabrication line, comprising:

processing a substrate in a processing apparatus which is a component of the semiconductor fabrication line;

detecting foreign particle defects on the substrate processed in the processing apparatus utilizing a plurality of illumination optical units and a plurality of detection optical units without removal of the substrate from the semiconductor fabrication line while continuing fabrication of the semiconductor devices while utilizing a foreign particle detector having a pitch variable spatial filter to cut a light reflected from a pattern formed on the substrate, wherein a light cutting portion of the pitch variable spatial filter is pitch variable according to the pattern;

sending a detected signal from the detecting apparatus to a foreign particle detecting processing apparatus which is separate from the detecting apparatus;

processing the detected signal sent from the detecting apparatus by the foreign particle detecting processing apparatus;

obtaining information of distribution of foreign particle defects on the substrate from the processed detected signal obtained at the step of processing of the detected signal and storing the obtained information in a memory;

wherein the step of detecting foreign particle defects is performed in real time.

9. (original) A processing method according to claim 8, further comprising a step of determining a foreign particle generation condition of the processing apparatus using information of detecting.

10. (currently amended) A processing method for semiconductor devices in a semiconductor fabrication line, comprising:

processing a substrate in a processing apparatus which is a component of the semiconductor fabrication line;

detecting foreign particle defects on the substrate processed in the processing apparatus utilizing a plurality of illumination optical units and a plurality of detection optical units without removal of the substrate from the semiconductor fabrication line while continuing fabrication of the semiconductor devices while utilizing a foreign particle detector having a pitch variable spatial filter to cut a light reflected from a pattern formed on the substrate, wherein a light cutting portion of the pitch variable spatial filter is pitch variable according to the pattern;

sending a detected signal from the detecting apparatus to a foreign particle detecting processing apparatus which is separate from the detecting apparatus;

processing the detected signal sent from the detecting apparatus by the foreign particle detecting processing apparatus; and

determining a foreign particle generation condition of the processing apparatus using information obtained at the step of processing the detected signal.

11. (original) A processing method according to claim 10, wherein if the foreign particle generation condition of the processing apparatus is determined to be abnormal in the determining step, information of the abnormality is outputted.

12. (currently amended) A semiconductor processing method, comprising the steps of:

detecting foreign particle defects on a substrate by a foreign particle detection means having a pitch variable spatial filter to cut a light reflected from a pattern formed on the substrate, a cutting portion of the pitch variable spatial filter being pitch variable according to the pattern, and the foreign particle detection means being attached to at least one processing apparatus which is a component of a semiconductor fabricating system;

sending a detected signal from the foreign particle detection means to a foreign particle detecting processing apparatus which is separate from the foreign particle detection means;

determining the foreign particle generating condition of at least one of the at least one processing apparatus.

13. (previously presented) A semiconductor processing method according to claim 12, wherein the foreign particle on the substrate is detected during a transfer of the substrate by a transfer unit.

14. (previously presented) A semiconductor processing method according to claim 12, wherein an information of the foreign particle defects is outputted based on detected data of the foreign particle defects on the substrate.

15. (currently amended) A semiconductor processing system, comprising:
at least one processing apparatus to process a substrate, the at least one processing apparatus being a component of the semiconductor processing system;
at least one detecting unit having plural illumination optical units and plural detection optical units and which is attached to said at least one processing

apparatus and detects foreign particle defects on the substrate with the plural illumination optical units and the plural detection optical units, the at least one detecting unit having a pitch variable spatial filter to cut a light reflected from a pattern formed on the substrate, wherein a light cutting portion of the pitch variable spatial filter is pitch variable according to the pattern;

a foreign particle detecting processing unit which is separate from the at least one detecting unit and receives a detected signal from the at least one detecting unit to process the received detected signal; and

a determining unit to determine a foreign particle generating condition from data of the foreign particle detecting processing unit.

16. (previously presented) A semiconductor processing system according to claim 15, wherein the foreign particle defects on the substrate are detected by the detecting unit attached to said at least one processing apparatus after transferring the substrate by a transfer unit from said at least one processing apparatus.

17. (currently amended) A semiconductor processing system, comprising:
at least one processing apparatus to process a substrate, the at least one processing apparatus being a component of the semiconductor processing system;

a detecting unit which is attached to said at least one processing apparatus and detects foreign particle defects on the substrate with a sensor by cutting a light reflected from a pattern formed on the substrate with a pitch variable spatial filter, wherein a light cutting portion of the pitch variable spatial filter is pitch variable according to the pattern;

a foreign particle detecting processing unit which is separate from the detecting unit and receives a detected signal from the detecting unit to process the received detected signal; and

a foreign particle control system which receives foreign particle data processed by the foreign particle detecting processing unit.

18. (previously presented) A semiconductor processing system according to claim 17, wherein the foreign particle defects on the substrate are detected by the detecting unit attached to said at least one processing apparatus after transferring of the substrate by a transfer unit from said at least one processing apparatus.

19. (previously presented) A semiconductor processing system according to claim 17, wherein the foreign particle control system outputs information for control of the foreign particles.

20. (currently amended) A semiconductor processing method comprising the steps of:

detecting foreign particle defects on a substrate during processing of the substrate in a semiconductor fabrication line by a foreign particle detecting unit having plural illumination units and plural detection units and which is attached to one processing apparatus of the semiconductor fabrication line, the foreign particle detecting unit having a pitch variable spatial filter to cut a light reflected from a pattern formed on the substrate, wherein a light cutting portion of the pitch variable spatial filter is pitch variable according to the pattern;

sending a detected signal from the foreign particle detecting unit to a foreign particle detecting processing which is separate from the foreign particle detecting unit; and

determining the foreign particle generation condition of the semiconductor fabrication line in accordance with foreign particle processed data.

21. (previously presented) A semiconductor processing method according to claim 20, wherein the semiconductor fabrication line includes a plurality of processing units, each processing unit for performing a single processing of the substrate, the step of detecting being effected by the foreign particle detecting unit attached to the one processing apparatus and after the detection, the substrate is transferred to another processing apparatus which performs a process subsequent to a process of the one processing apparatus.

22. (currently amended) A semiconductor processing method comprising the steps of:

processing a substrate with a first processing apparatus which is a component of a semiconductor fabricating system;

transferring the substrate from the first processing apparatus to a foreign particle detection unit attached to the first processing apparatus;

detecting foreign particle defects on a substrate by the foreign particle detection unit having a pitch variable spatial filter to cut a light reflected from a pattern formed on the substrate, wherein a light cutting portion of the pitch variable spatial filter is pitch variable according to the pattern;

sending a detected signal from the foreign particle detection unit to a foreign particle detection processing which is separate from the foreign particle detection unit; and

transferring the substrate from the foreign particle detection unit to a second processing apparatus which is a component of the semiconductor fabricating system; and

processing the substrate with the second processing apparatus.

23. (previously presented) A semiconductor processing method according to claim 22, wherein the foreign particle defect is detected by detecting a predetermined area of the substrate.

24. (previously presented) A semiconductor processing method according to claim 22, wherein the foreign particle defect is detected by a linear image sensor.

25. (previously presented) A semiconductor processing method according to claim 22, wherein the first processing apparatus is an etching apparatus.

26. (previously presented) A processing method according to claim 1, further comprising controlling an operation of the semiconductor fabrication line in accordance with the data foreign particle defects detected.

27. (previously presented) A processing method according to claim 1, further comprising obtaining information of distribution of foreign particle defects on the substrate and storing the obtained information in the memory, wherein the step of detecting foreign particle defects is performed in real time.